

# Expedition MANGAN 2021 with MV ISLAND PRIDE (04.04.2021 – 15.05.2021)



## Weekly report No. 1 (01 to 04 April 2021)

Expedition MANGAN 2021 aims at independently monitoring and assessing the environmental impacts of *in situ* technical tests of a pre-prototype manganese nodule collector vehicle (Patania II) that has been developed by the Belgian company Global Sea Mineral Resources (GSR). The environmental monitoring will be carried out in close collaboration with European research institutes from the JPI-O MiningImpact Consortium, who have been invited to join this campaign in a joint effort to obtain a sound scientific basis for the analysis and modelling of mining-related impacts. We hope that the results of this campaign will greatly contribute to the development of robust environmental standards that are required by the International Seabed Authority as an essential component of its future exploitation regulations, also known as the Mining Code.

During this six-week cruise on the Norwegian multi-purpose vessel ISLAND PRIDE, we intend to intensively monitor two collector tests that will take place in the Belgian and German contract areas of the Clarion-Clipperton Zone (CCZ) in the eastern Central Pacific Ocean, respectively. This is the first sub-industrial scale mining vehicle ever to be tested. For the monitoring of environmental change on and around the seafloor, state-of-the-art tools such as two remotely-operated vehicles (ROV), an autonomous underwater vehicle (AUV), *in situ* oxygen profilers and experiment chambers, *in situ* pumps and fifty inter-calibrated hydro-acoustic and optical sensors for measuring the suspended sediment concentrations in the sediment plume will be deployed. 23 scientists from 8 institutes in Europe will, amongst others, analyse the distribution and settling behaviour of the sediment plume whirled up by the collector, faunal changes across different size classes, biogeochemical fluxes, changes in microbial turnover rates and functions, *in situ* ecotoxicology, release of trace metals from the suspended sediment plume and noise emissions by the collector vehicle.

The logistics of this cruise in the midst of a pandemic have been challenging. The transports of eight containers with scientific equipment from Hamburg, planned to arrive already on 08 March, have suffered more than four weeks of delay and are still making their way through the congestion in the port of Los Angeles at the moment. Although difficult to predict, we are assuming a 5-day delay of departure from the port of San Diego to our study sites due to this. With visas for the USA being issued just days before our scheduled flights to the USA, 23 scientists and two journalists from Südwestrundfunk (SWR) flew to Los Angeles on 23 April and spent 12 nights in a self-isolation hotel in San Diego before boarding the vessel today, after having received another round of negative PCR-test results. Strict hygiene measures will be adhered to for at least another 10 days on the vessel in order to minimise the chance of a COVID infection on board to the greatest possible extent. This is all part of a considerate hygiene plan that has been developed specifically for this cruise and has been aligned with requirements of the ship operator and the participants' home institutes.

Since the start of mobilisation on 01 April, the crew of the ISLAND PRIDE has been preparing the ship for this scientific expedition by installing five laboratory containers with grillage, an Okeanus Winch with 6000 m coaxial cable for our equipment deployments and a reefer for the storage of our samples. On the evening of Friday 02 April, the MV NORMAND ENERGY with the Patania II collector on board departed from the port of San Diego with technicians and scientists from GSR and Massachusetts Institute of Technology (MIT) on board. We will meet up with them in the Belgian contract area as soon as we can. On Saturday 03 April, one container of NIOZ (The Netherlands) could be unstuffed, and one BGR container arrived. We are now waiting for the additional seven containers to arrive. Until then, time is spent effectively sorting through the huge amounts of airfreight, inspecting the laboratories, discussing with crew members and the ROV and AUV specialists on board, and making detailed deployment plans to increase efficiency and make up for lost time as much as reasonably possible.

Planned day of departure was today, 04 April. Every hour spent longer in the harbour is a loss of time for science. The agents are doing their best to retrieve those containers from the port of Los Angeles as fast as they can, once customs and port authorities have cleared them.

All participants are healthy and looking forward to this exciting expedition. We wish everyone at home a good Easter Monday and send our best regards from MV ISLAND PRIDE,

On behalf of all participants,

Annemiek Vink